

Compound Inequalities

I Do

$$\begin{array}{r} -5 \leq x - 4 \leq 13 \\ +4 \quad +4 \quad +4 \\ \hline \end{array}$$

$$-1 \leq x \leq 17$$



$[-1, 17]$ ← interval notation
use $[]$ if \geq use $()$ if $>$

Could also solve it this way →

$$-5 \leq x - 4 \leq 13$$

$$\begin{array}{r} -5 \leq x - 4 \leq 13 \\ +4 \quad +4 \quad +4 \\ \hline \end{array}$$

$$-1 \leq x \quad \text{and} \quad x \leq 17$$

$$-1 \leq x \leq 17$$

Why did I use closed endpoints instead of open ones?

Fist to Five - How well do you understand what I just did?

We Do

$$\begin{array}{r} -12 < 2 - 5x \leq 7 \\ -2 \quad -2 \quad -2 \\ \hline \end{array}$$

$$\begin{array}{r} -14 < -5x \leq 5 \\ -5 \quad -5 \quad -5 \\ \hline \end{array}$$

$$\frac{14}{5} > x \geq -1$$

Rewrite $-1 \leq x < \frac{4}{5}$



Reminder
When x or y is by a negative # you must flip the sign

Why would I want to rewrite my answer? Did it help me at all?

You Do (wkbk pg 22 #17)

$$\begin{array}{r} 5 < 2 - 3y < 14 \\ -2 \quad -2 \quad -2 \\ \hline \end{array}$$

$$\begin{array}{r} 3 < -3y < 12 \\ -3 \quad -3 \quad -3 \\ \hline \end{array}$$

$$-1 > y > -4 \quad \leftarrow \text{Flip the signs!}$$

After students solve, have everyone open their wkbks + look at the MC choices. Pair-Share.

Discuss the MC options.

Is your answer one of the MC options?

~~How~~ Is there a way to rewrite your answer to match one of the MC options?

I Do
 $|5x+3| < 7$

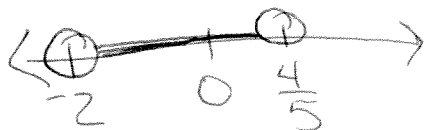
This means that $5x+3$ has to be less than 7 away from zero. Think on a # line



Remember the definition of absolute value?

So $5x+3 > -7$ and $5x+3 < 7$

$$\begin{array}{r} -3 \quad -3 \\ \hline 5x > -10 \\ \hline x > -2 \end{array} \qquad \begin{array}{r} -3 \quad -3 \\ \hline 5x < 4 \\ \hline x < \frac{4}{5} \end{array}$$



Set up - DON'T SOLVE - the following

$|4x+6| \leq 3$ $|1x-4| < 8$

$|-6x+2| > 5$ $|-3x+1| \geq 4$

Thumbs Up/Down - How well do you understand setting up these abs. value ineq. problems?

We Do
 $|2x+4| \geq 6$

This means $2x+4$ has to be greater than or equal to 6 away from zero.



$2x+4 \leq -6$ or $2x+4 \geq 6$

$$\begin{array}{r} -4 \quad -4 \\ \hline 2x \leq -10 \\ \hline x \leq -5 \end{array} \qquad \text{or} \qquad \begin{array}{r} -4 \quad -4 \\ \hline 2x \geq 2 \\ \hline x \geq 1 \end{array}$$



How is this problem similar to the one above?
 How is it different?

You Do (Wk bk pg 22 #18)

$|2x-1| \geq 5$ This means that $2x-1$ has to be greater than or equal to 5 away from zero.



$2x-1 \leq -5$ or $2x-1 \geq 5$

$$\begin{array}{r} +1 \quad +1 \\ \hline 2x \leq -4 \\ \hline x \leq -2 \end{array} \qquad \text{or} \qquad \begin{array}{r} +1 \quad +1 \\ \hline 2x \geq 6 \\ \hline x \geq 3 \end{array}$$



when students are done, open wk bk and have students Think-Pair-Share. What is the answer?

How could we use test strategies to solve, even if we don't know how to do the problem?